Bruhath Bengaluru Mahanagara Palike

QUALITY ASSURANCE/QUALITY CONTROL REPORT

Office of the Chief Engineer (Quality Assurance/Control) Annexure-05,
BBMP Head Office, Hudson circle Bengalore-001,
Ph.no:08022975541, E-mail ID:qualitycontrol.bbmp@gmail.com

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QUALITY ASSURANCE / QUALITY CONTROL REPORT

SE/QA/PR/ 140 /2022-23, DATE: 16/5/23

Name of Work	:	Construction of Rajarajeshwari School (Kalpana Road) building in Ward no. 17, J P Park. Estimation Cost of 990.00 Lakhs.
Job Code	:	017-19-000004
Bill No. & Bill Amount	:	**4th & Final Bill.** **Rs. 63,67,735.00.**
Type of Test Performed	:	Physical Verification of below materials for its Existence. IS 1542-1992, IS 1608:2005, IS: 269:2015. IS 1077:1992, Clause 7.1, 7.2, 7.3 and 6.2(b).
Materials on which Tests Was Performed	:	1. UPVC Windows, Fixtures, Sliding Shutters, Flash Doors. 2. 3trussX2Panels Sliding Windows. 3. Steel. 4. Bricks. 5. Plastering Sand.
Officers present during inspection	:	1. Smt. Vijayamala Balagi, EE – Quality Assurance. 2. Sri. S V Malagavi, AEE – Quality Assurance. 3. Sri. Nagaraj, Contractor Representative. 4. Sri. Channakeshava, PMC Supplier.
Project Management Consultants	:	**M/S. ESS ESS BUILDERS NAGARABAVI, BANGALORE.**
Observations	:	Physical Verification was done to check whether the items were executed by Project Management Consultants at the site at 1 location in presence of EE & AEE of QA division. The manufacturer certificate showing the specification of the material was revived of UPVC Windows, Fixtures, Sliding Shutters, Flash Doors and 3trussX2Panels Sliding Windows. However the Certificates given by the PMC were furnished to BBMP QA department are reproduced in the tables shown below:
Test Locations	:	1. **Location 1: BBMP Scholl at JP Park in Ward no. 17.**

15/5/23
ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ ವಿಭಾಗ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

15/5/23
ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ ವಿಭಾಗ
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15/05/23
ಅಧೀಕ್ಷಕ ಅಭಿಯಂತರರು
ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ
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Table-1: Physical Verification Test of UPVC Doors & Windows Results for above locations.

Sl. No.	TYPE OF COMPONENT	CRACK LENGTH	TOTAL LENGTH	FACTOR	CFM
DOOR					
1	Door D1	3.1	3.1	0.5	1.55
2	Door D2	3.1	3.1	0.5	1.55
				TOTAL CFM	3.1
WINDOWS					
1	Window W	3.5	3.5	0.37	1.295
2	Window W1	3.3	3.3	0.37	1.221
3	Window W2	2.7	2.7	0.37	0.999
				TOTAL CFM	3.515

Table – 02: Plastering Sand

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits as per IS 1542-1992
10	0	0	0	100	100
4.75	24	2.40	2.40	97.6	95-100
2.36	21	2.10	4.50	95.5	95-100
1.18	38	3.80	8.30	91.7	90-100
600 Micron	65	6.50	14.80	85.2	80-100
300 Micron	229	22.90	37.70	62.3	20-65
150 Micron	502	50.20	87.90	12.1	0-15

Table-03: IS 1608:2005 Metallic Materials- Tensile Testing at Ambient Temperature

S.No	Brand	Nominal size (dia in mm)	Mass per meter (kg/meter)	TENSILE STRENGTH			
				0.20 % proof stress/ yield stress (N/mm^2)	Tensile strength (N/mm^2)	TS/YS ratio	Elongation, percent on gauge length
1	TMT	8	0.398	518	622	1.20	21
2	TMT	10	0.619	503	615	1.22	24
3	TMT	12	0.887	527	613	1.16	19
4	TMT	16	1.582	536	628	1.17	20
5	TMT	20	2.471	522	602	1.15	17
6	TMT	25	3.85	507	636	1.25	26

Table-04: Cement (Ramco 53 grade OPC)

Sl.No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 269:2015
1	a) Initial Setting Time	IS-4031 (Part - 5):1988(RA 2014)	125 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part - 5):1988(RA 2014)	360 Minutes	Not More than 600 Minutes
2	Soundness	IS-4031 (Part 3) :1988 (RA 2014) by the Le-Chatelier method	1 mm	Not more than 10 mm
3	Standard Consistency	IS-4031 (Part -4)	28.00%	-

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Bricks

COMPRESSIVE STRENGTH

Sl.No.	Compressive strength of individual bricks (N/mm2)	Acceptability as per IS 1077:1992, Clause 7.1
1	5.6	The bricks shall have a minimum average compressive strength for various classes as given in Table 1 of IS 1077: 1992. The compressive strength of any individual bricks shall not fall below the minimum compressive strength specified for the corresponding class of brick by more than 15%.
2	5.2	
3	5.4	
4	5.3	
5	5.1	
Average of 5 bricks	5.3	

WATER ABSORPTION

Sl.No.	Water Absorption(%)	Acceptability as per IS 1077:1992, Clause 7.2
1	10.8	The water Absorption of bricks shall not be more than 20% by weight upto class 12.5 and 15% by weight for higher classes.
2	10.5	
3	10.2	
4	10.4	
5	10.6	
Average of 5 bricks	10.5	

EFFLORESCENCE

Sl.No.	Efflorescence	Acceptability as per IS 1077:1992, Clause 7.3
1	Moderate	The efflorescence shall not be more than 'moderate" upto class 12.5 and "slight" for higher classes.
2	Moderate	
3	Moderate	
4	Moderate	
5	Moderate	

DIMENSIONS AND TOLERANCES

Sl.No.	Dimensions obtained for 20 bricks(mm)		Acceptability as per IS 1077:1992, Clause 6.2(b)
1	Length	4610	4520 to 4680 mm
2	Width	2195	2160 to 2240 mm
3	Height	1415	1360 to 1440 mm

Requirement As Per IS 1077:1992

Table 1.Classes of Common Burnt Clay Brick

Class Designation	Average Compressive Strength not Less Than	
	N/mm²	(kgf/cm²) (approx)
35	35	350
30	30	300
25	25	250
20	20	200
17.5	17.5	175
15	15	150
12.5	12.5	125
10	10	100
7.5	7.5	75
5	5	50
3.5	3.5	35

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Conclusion:

The file containing 4th & final bill has been submitted for the above work to QA department on 21.04.2023 requesting to provide spot inspection. Engineers of QA/QC division have visited the work spot on 28.04.2023.

During inspection, it was reported by Engineer in charge of work and PMC consultant that the items pertaining to 4th & final bill have already been executed by the contractor. PMC team was instructed to assess the UPVC Doors and Windows. PMC have conducted Physical Verification in Field in presence of engineer in charge of work and have submitted test results.

From the test results and Certificates furnished by PMC consultants, it is concluded that the results and Certificates of the samples collected are in accordance with the standards/ specifications mention in the BIS codes. However, the results submitted by the PMC have been reproduced here with for further needful action. The results checked by QA/QC relates only for item tested in the particular location randomly.

Further, QA/QC directs the PMC and Engineer in-charge of the work that all materials used for the work shall be inspected, tested and accepted as per the relevant specifications before incorporation in the work. The frequencies and methods of sampling and testing materials, including those required for definite purpose and not covered by MORT&H specifications shall be in accordance to the relevant IRC or BIS or AASHTO/ASTM/BS standards in order of priority.

All materials or work not conforming to the requirements of the specifications shall be considered unacceptable and rejected. The unacceptable materials or works that are rejected shall be immediately removed unless the defects are corrected and approved by the engineer in-charge of work.

The concerned Engineer in charge of the work shall follow the direction issued by Chief Commissioner Letter number dated 01.08.2022 and 14.09.2022 and take necessary action as appropriate in accordance with the law.

Note:-

I. This report by QA/QC is pertaining to the work carried out in 4th & final bill only. Therefore, further QA/QC reports shall be obtained for the items of work carried out in future Running Account bill / Final bill.

II. Safety precautions shall be taken at work spot to prevent any mishap, injuries or loss of life to general public and construction workers according to guidelines laid down in code of practices.

III. Engineer in charge of work shall obtain requisite approval and Implement traffic management plan prior to commencement of work.

IV. Engineer in charge of work shall display details of work, work code, cost of project, start and completion date, and information of Engineer in charge of work with contact numbers at workspot.

V. Engineer in charge of work and Agency shall ensure that if any damages or defects occur pertaining to the executed work within the Defect Liability period (DLP) as per agreement the same shall be rectified immediately on top priority without fail.

VI. The amount claimed for work slip /EIRL items shall be released to contractor upon obtaining approval from competent authority.

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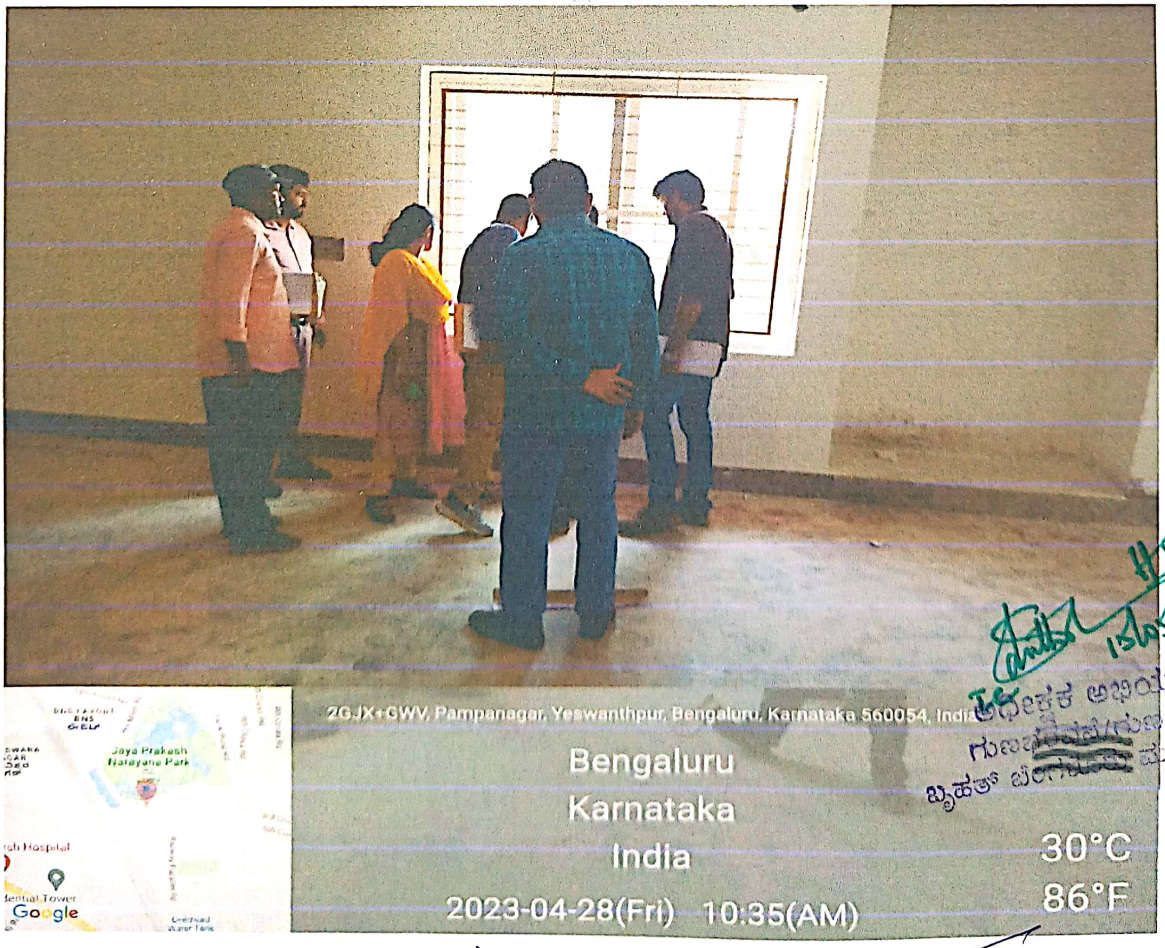
Location 1: BBMP Scholl at JP Park in Ward no. 17.



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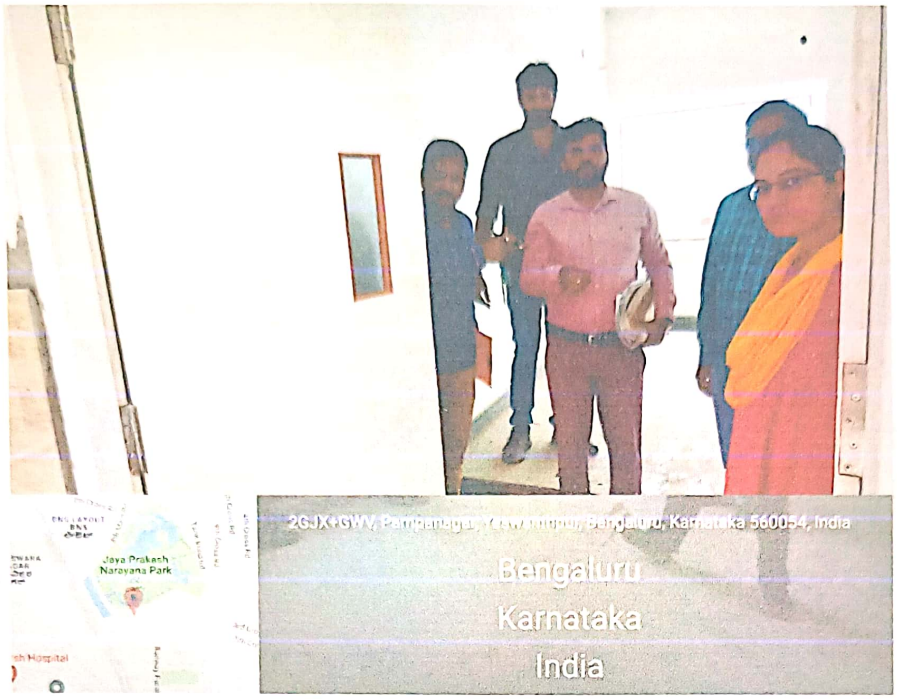

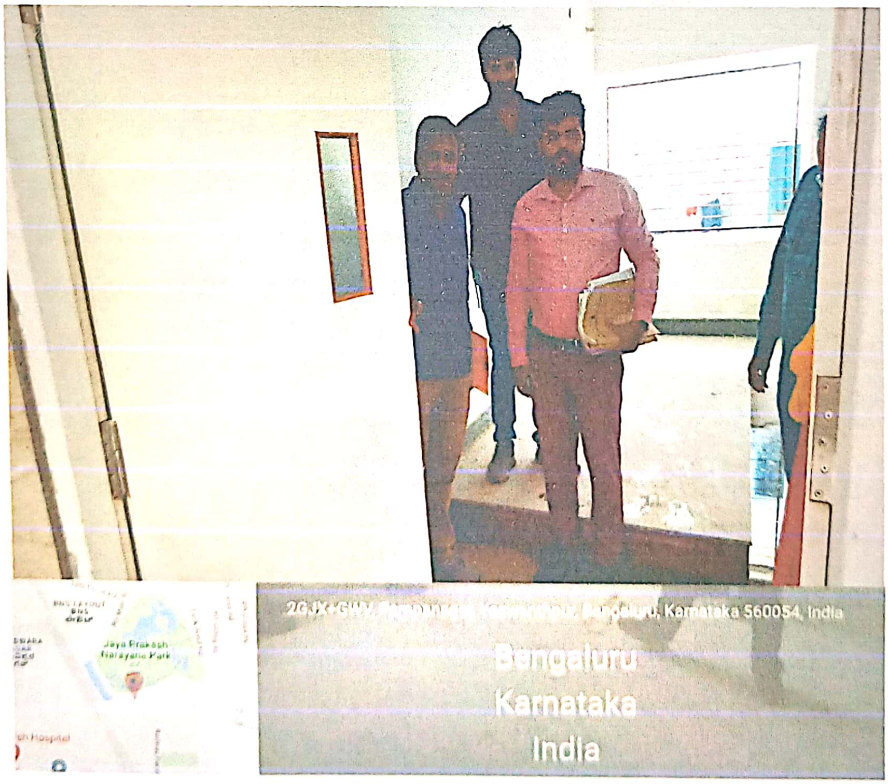

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